

Lithography Groundrule

Figure 1

PREDICTED vs ACTUAL COST COMPARISON OF TECHNOLOGY COST ESTIMATE WORKSHEET

TECHNOLOGY	NAME	PREDICTED	ACTUAL	% DELTA
CM4L 3LM	OMNI	\$872	\$833	4.7%
CM4LP 3LM	PHEONIX	\$805	\$856	-6.0%
CM5S 4LM	MUSTANG	\$1,188	\$1,121	6.0%
CM5S1 5LM	RACER	\$1,236	\$1,227	0.7%
CM5X 4LM	APACHE	\$1,191	\$1,152	3.4%
CM5X2 4LM	FURY	\$1,248	\$1,167	6.9%
CM6S 4LM	HURRICANE	\$1,322	\$1,340	-1.3%
CM6S2 4LM	TIGGER	\$1,407	\$1,299	8.3%
CM6S2 5LM	SC / 98	\$1,560	\$1,469	6.2%
CM6SF 4LM	PYTHON	\$1,531	\$1,437	6.5%
CM6SF 5LM	LONGTRAIL	\$1,816	\$1,691	7.4%
CM6X 4LM	TYPHOON	\$1,704	\$1,670	2.0%
CM7S 6LM	LONESTAR	\$2,464	\$2,607	-5.5%
CM7SF 3LM	COMMANDER	\$1,918	\$2,020	-5.0%
CM8S 4LM	BLIZZARD	\$2,238	\$2,240	-0.1%
SIGE6SF	COPERNICUS	\$2,809	\$2,726	3.0%
ICEC8S2 6LM	MAJESTIC *	\$3,214	\$3,325	-3.3%
ICEC9S 7LM	MAKO **	\$3,870	\$3,534	9.5%

* Predictive Cost Estimated 12 Months Prior to Actual

** Predictive Cost Estimated 18 Months Prior to Actual

FIGURE 2

EQUATIONS FOR

TECHNOLOGY COST ESTIMATE WORKSHEET

<u>Feature</u>	<u>Full Capacity Cost Equation</u>	<u>Mature Cost Equation</u>	<u>Where:</u>	<u>How Derived</u>
FEOL BASE	$Y=272X^{-0.53}$	$Y=241X^{-0.493}$	Y = FEOL Base Cost = Groundrule	Least Squares Analysis
BEOL BASE	$Y=417X^{-0.486}$	$Y=388X^{-0.461}$	Y = BEOL Base Cost = Groundrule	Least Squares Analysis
BR RESISTOR	$Y=15.1X^{-0.362}$	$Y=13.5X^{-0.352}$	Y = BR Resistor Cost X = Groundrule	Least Squares Analysis
KV LEVEL	$Y=15.5X^{-0.297}$	$Y=12.5X^{-0.489}$	Y = KV Level Cost = Groundrule	Least Squares Analysis
TAILOR VTS	$Y=49.8X^{-0.048}$	$Y=45.9X^{-0.0302}$	Y = Tailor VTs Cost = Groundrule	Least Squares Analysis
DUAL GATE	$Y=38.2X^{-0.803}$	$Y=33.7X^{-0.815}$	Y = Dual Gate Cost = Dual Gate Levels	Least Squares Analysis
OP RESISTOR	$Y=19.8X^{-0.512}$	$Y=17.9X^{-0.502}$	Y = OP Resistor Cost X = Groundrule	Least Squares Analysis
MC LEVEL	$Y=58.8X^{-0.597}$	$Y=53.9X^{-0.584}$	Y = MC Level Cost = Groundrule	Least Squares Analysis
METAL LEVELS	$Y=111X^{-0.302}$	$Y=103X^{-0.282}$	Y = Metal Level Cost X = Groundrule	Least Squares Analysis
MIM CAPACITOR	$Y=34.2X^{-0.523}$	$Y=30.8X^{-0.533}$	Y = MIM Cap Cost = Groundrule	Least Squares Analysis
TD LEVEL	85	77	NA	Direct Measurement
EDRAM	475	450	NA	Direct Measurement
CU ADDER	100	80	NA	Direct Measurement

FIGURE 4

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TECHNOLOGY COST MODEL OVERVIEW

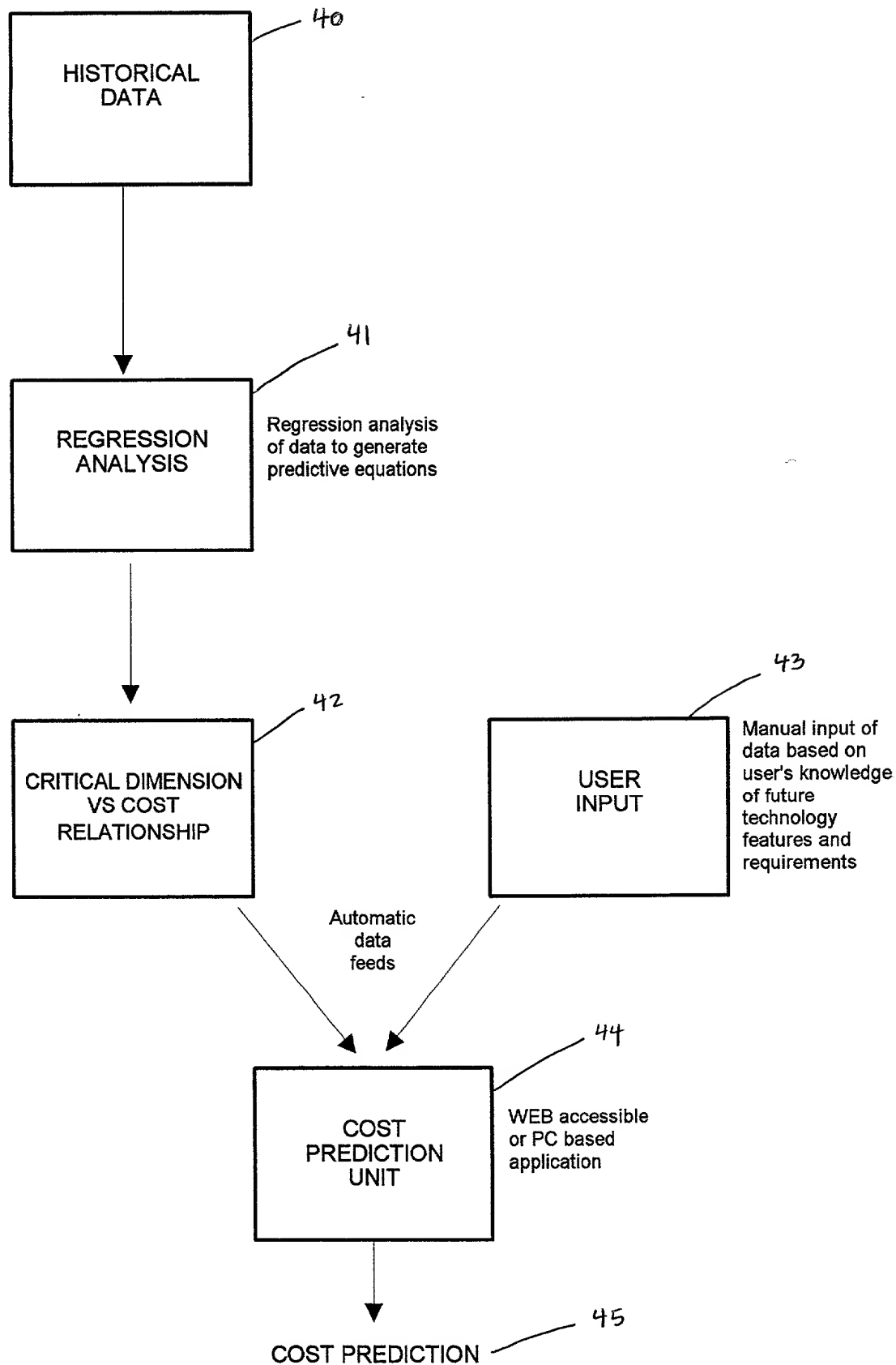


FIGURE 5

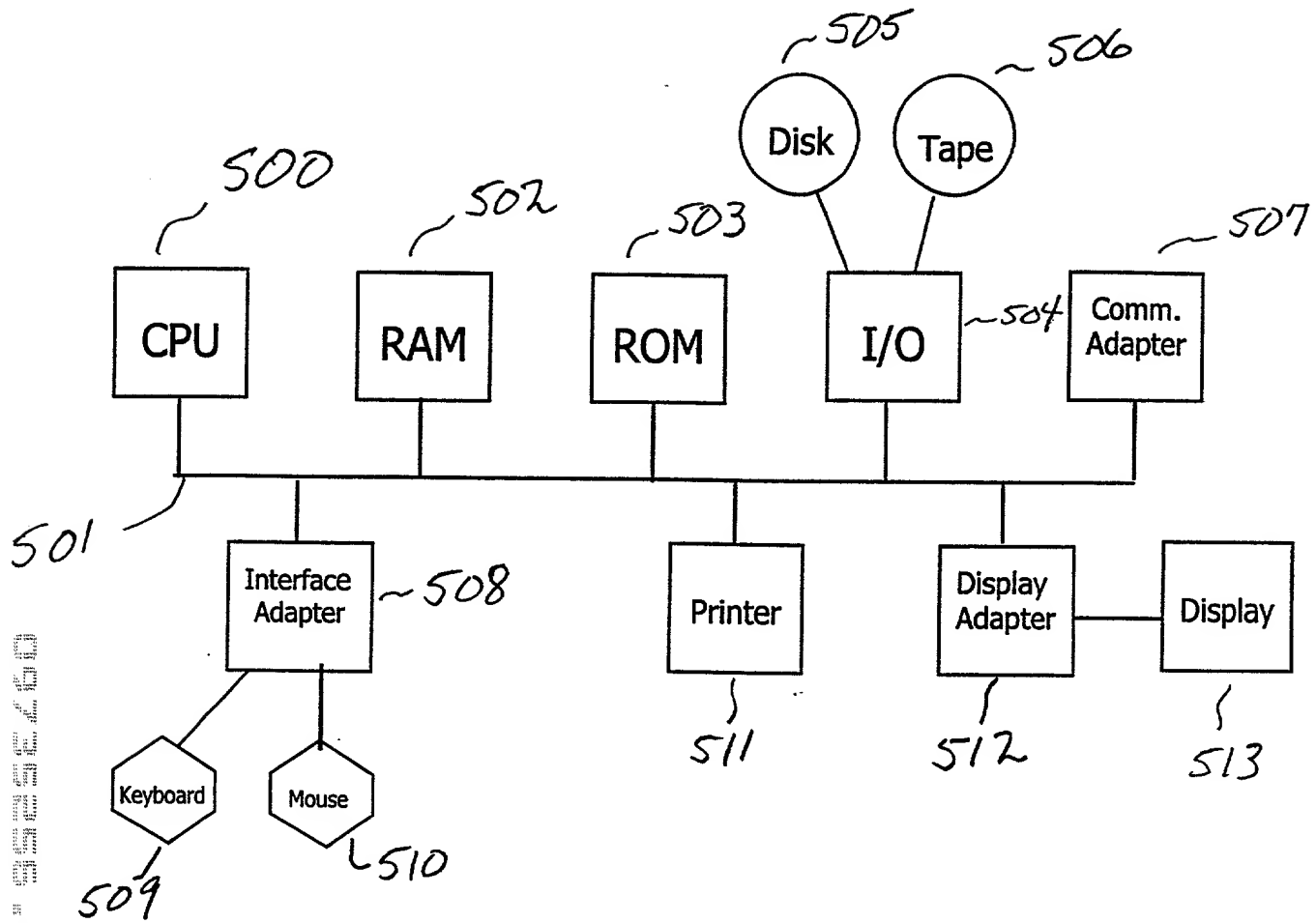


Figure 6